

Sylvilagus insonus.

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Sylvilagus Gray, 1867

Sylvilagus Gray, 1867:221. Type species *Lepus sylvaticus* Bachman (= *floridanus* J. A. Allen).

Tapeti Gray, 1867:224. Type species *Lepus brasiliensis* Linnaeus.

Hydrolagus Gray, 1867:221. Type species *Lepus aquaticus* Bachman.

Limnolagus Mearns, 1897:393. Type species *Lepus aquaticus* Bachman.

Microlagus Trouessart, 1897:660. Type species *Lepus cinerascens* J. A. Allen.

Paludilagus Hershkovitz, 1950:333. Type species *Lepus palustris* Bachman.

CONTEXT AND CONTENT. Order Lagomorpha, Family Leporidae, Subfamily Leporinae, Genus *Sylvilagus*. This genus is restricted to the New World and contains 14 species (Angermann et al., 1990; Chapman et al., 1992; Hall, 1981). *Brachylagus* (including only *idahoensis*) was considered a subgenus of *Sylvilagus* (Hall, 1981); however, Corbet (1983) recommended exclusion of *Brachylagus* from *Sylvilagus*. Hershkovitz (1950) reduced *S. dicei* to a subspecies of *S. brasiliensis*. Diersing (1981), however recognized specimens from the Cordillera of Costa Rica and Panama as *S. dicei*. Data from karyology (Ruedas et al., 1989) and morphometry (Chapman et al., 1992) supported the recognition of the sibling species *S. transitionalis* and *S. obscurus* within what had been regarded as *S. transitionalis*. The following key to species of *Sylvilagus* is derived from Chapman et al. (1992), Diersing (1981), Hall (1981), and Hoffmeister and Lee (1963):

- 1 Anterior extension of supraorbital process absent or if a point barely indicated, then $\geq 83\%$ or all of posterior process fused to braincase 2
- Anterior extension of supraorbital process present and posterior extension free of braincase or leaving a slit between process and braincase 5
- 2 Ear > 58 mm from notch in dried skin; tail > 66 mm; basilar length of skull > 63 mm *S. aquaticus*
- Ear < 58 mm from notch in dried skin; tail < 40 mm; basilar length of skull < 63 mm 3
- 3 Underside of tail brown or gray; posterior extension of supraorbital process always fused to skull, usually for entire length, but in occasional specimens a small foramen at middle of posterior extension of supraorbital process *S. palustris*
- Underside of tail white; posterior extension of supraorbital process tapering to a slender point, free of braincase or barely touching and leaving a slit or long foramen 4
- 4 Ratios between skull dimensions (mean ± 1 SD): length of hard palate to length of palatal vacuity, 32.7 ± 2.1 ; breadth of I1 to anterior frontal breadth, 16.2 ± 0.9 ; length of hard palate to anterior frontal breadth, 35.8 ± 2.5 ; restricted to Appalachian Mountains and associated mountain balds from Hudson River southwest through New York, Pennsylvania, Maryland, West Virginia, Virginia, Tennessee, North Carolina, South Carolina, Georgia, and Alabama *S. obscurus*
- Ratios between skull dimensions: length of hard palate to length of palatal vacuity, 35.8 ± 2.6 ; breadth of I1 to anterior frontal breadth, 18.6 ± 1.2 ; length of hard palate to anterior frontal breadth, 41.9 ± 3.1 ; restricted to Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, and New York as far west as Hudson River *S. transitionalis*
- 5 Tympanic bullae large, usually ca. 12.3 mm long; ratio of

- basal length to length of bullae ca. 24.5; ratio of basilar length to length of bullae ca. 25.4 *S. audubonii*
- Tympanic bullae small, usually < 12.3 mm long; ratio of basal length to length of bullae ca. 18.5; ratio of basilar length ca. 19.9 6
- 6 Length of hind foot < 81 mm; restricted to Pacific coastal



FIG. 1. Dorsal, ventral, and lateral views of the skull and lateral view of the mandible of *Sylvilagus insonus* from Omilteme, Guerrero, Mexico (female, University of Kansas Museum of Natural History, 98742). Greatest length of skull is 77.9 mm. (Photograph by Robert A. Timm).

- strip from Columbia River south to tip of Baja California, west of Sierra Nevada-Cascade mountain chain 7
 Length of hind foot usually >81 mm; east of Pacific coastal strip 8
 7 Occurring on mainland *S. bachmani*
 Occurring only on San Jose Island *S. mansuetus*
 8 North of United States-Mexico boundary 9
 South of United States-Mexico boundary 10
 9 In Arizona, New Mexico, and southern Colorado, posterior extension of supraorbital process free of braincase, and supraoccipital shield posteriorly pointed; from central Colorado north into Canada, diameter of external auditory meatus more than crown length of last three cheek-teeth *S. nuttallii*
 In Arizona, New Mexico, and southeastern Colorado, posterior extension of supraorbital process of frontal with its tip against, or fused to, braincase, and supraoccipital shield posteriorly truncate or notched; from central Colorado north into Canada, diameter of external auditory meatus less than crown length of last three cheek-teeth *S. floridanus*
 10 Geographic range restricted to Tres Marias Islands *S. graysoni*
 Geographic range not including Tres Marias Islands 11
 11 Underside of tail dingy gray or buffy (not white) 12
 Underside of tail distinctly white 14
 12 Tail of moderate length (>30 mm) and dingy gray; ear from notch (dry) >53 mm *S. insonus*
 Tail short (<30 mm) and brown; ear from notch (dry) <53 mm 13
 13 Zygomatic breadth <35.0 mm; braincase breadth <26.0 mm; in lowlands of Costa Rica and Panama; occurring below 1,650 m *S. brasiliensis*
 Zygomatic breadth >37.0 mm; braincase breadth >27.0 mm; in Cordillera de Costa Rica and Panama; occurring above 1,650 m *S. dicei*
 14 Total length >476 mm; ear from notch (dry) >64 mm; interorbital breadth usually >19.3 mm; geographic range restricted to southwestern and central Mexico north of the Isthmus of Tehuantepec *S. cunicularius*
 Total length <476 mm; ear from notch (dry) <64 mm; interorbital breadth usually <19.3 mm; geographic range, from Canada to Panama *S. floridanus*

Sylvilagus insonus (Nelson, 1904)

Omilteme Rabbit

Lepus insonus Nelson, 1904:103. Type locality "Omilteme, Guerrero," Mexico.

Sylvilagus insonus Nelson, 1909:264. First use of current name combination.

CONTEXT AND CONTENT. Context same as for genus. *S. insonus* is monotypic.

DIAGNOSIS. *Sylvilagus insonus* is known only from three specimens and diagnostic information may not be accurate (Diersing, 1981; Hershkovitz, 1950). *S. cunicularius* is the only other *Sylvilagus* known from the state of Guerrero. *S. insonus* is smaller than *S. cunicularius* in all measurements (in mm—*S. insonus* and *S. cunicularius*, respectively), especially dry ear length (≤ 63.5 , ≥ 63.6); generally smaller cranially, particularly in first upper incisor length (≤ 7.5 , ≥ 8.1), greatest length of skull (≤ 78.0 , ≥ 78.4), length of nasals (≤ 32.1 , ≥ 32.8), basioccipital breadth (≤ 9.0 , ≥ 9.4), length of auditory bullae (≤ 9.6 , ≥ 9.7), depth of shield-bullae (≤ 21.4 , ≥ 21.9), depth of skull (≤ 32.0 , ≥ 33.5), breadth across the infraorbital canals (≤ 18.3 , ≥ 18.6), height of mandible (≤ 36.3 , ≥ 38.3), and depth of mandible ramus (≤ 11.3 , ≥ 12.2). Color is rufous-black dorsally rather than grayish (Diersing, 1981) as in *S. cunicularius*.

Sylvilagus insonus and *S. dicei* (from Costa Rica and Panama) are larger than *S. brasiliensis gabbi* and *S. b. truei* (from southeastern Mexico and Central America) in total length, length of body, length of hind foot, length of nasal, and length of the maxillary and mandibular toothrows (Diersing, 1981). *S. insonus* differs from both *S. brasiliensis* and *S. dicei* in much longer ears, longer bicolored tail (rather than unicolored), narrower basioccipital, narrower postdental breadth, deep-

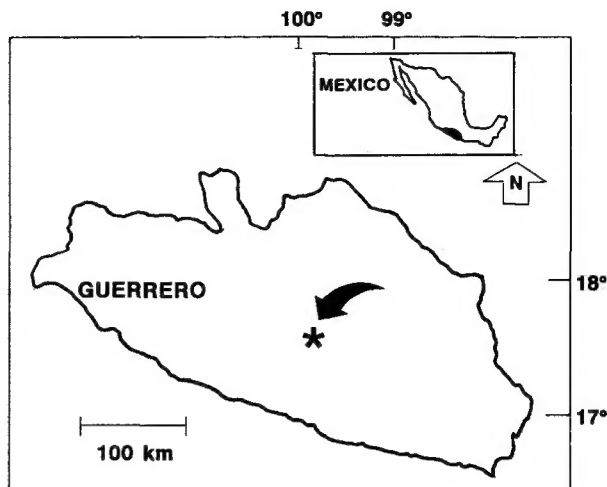


FIG. 2. Distribution of *Sylvilagus insonus* in the state of Guerrero, Mexico. It is known from the type locality (*) only (Hall, 1981).

er skull, and dorsal extensions of the premaxillaries, which usually extend posterior to the nasals rather than shorter than the nasals (Diersing, 1981). In addition, the dorsal pelage of *S. insonus* is rufous-black and the tops of the hind feet are whitish rather than dorsal pelage brownish-black or blackish-brown and tops of hind feet dark brown, as in *S. brasiliensis* and *S. dicei*.

GENERAL CHARACTERS. *Sylvilagus insonus* is a large-sized rabbit with long ears, hind feet of medium length, and small tail (Diersing, 1981). The skull is large with long palate, broad braincase, narrow breadth across nasals, large maxillary and mandibular toothrows, short incisive foramina, short diastema, narrow basioccipital, medium-sized auditory bullae, broad across the carotid foramina, narrow breadth across the infraorbital canals, shallow shield-bullae depth, shallow skull depth, squared supraoccipital shield, slender posterior section of supraorbital process—which is attached to the braincase, and flat supraorbital process (Diersing, 1981; Fig. 1). The dental formula of the Omilteme rabbit is $i\ 2/1$, $c\ 0/0$, $p\ 3/2$, $m\ 3/3$, total 28.

The dorsum is a mixture of rufous with much black, the nape is dull, dingy rusty-rufous, and the ears on convex surface are grizzled and dark blackish-brown, with more black along the anterior border and at the tip (Diersing, 1981; Nelson, 1904). The sides are grayish-black, the neck on sides and below dull dark buffy, sides of nose and orbital area dingy buffy-grayish, tail reddish-black dorsally, venter whitish except with a brownish throat patch, hind feet with much white on top, and soles of feet dark smoke brown (Diersing, 1981; Nelson, 1904). The unusual brownish color and large ears of *S. insonus* give it a superficial resemblance to *S. aquaticus*, but the skull is more like that of *S. gabbi truei* (= *S. brasiliensis truei*; Nelson, 1909). Of the three known specimens, external and cranial measurements (in mm) are available for only two, including the type specimen (reported first): total length, 430, 440; length of tail, 40, 45; length of hind foot, 93, 96; ear from notch in dried skin, 62, 59.8; basilar length, 57, 59.2; length of nasals, 31.5, 31.9; breadth of rostrum above premolars, 17, 22; depth of rostrum in front of premolars, 15, 16; interorbital breadth, 17.5, 17.7; parietal breadth, 26, 29.6; diameter of bullae, 9, 9.2 (Nelson, 1904, 1909).

DISTRIBUTION. This species is known from the type locality only (Fig. 2). Its distribution is limited to the heavily wooded summit of a small, semi-isolated mountain range of Sierra Madre del Sur, located in the surroundings of the small village of Omilteme, Guerrero, Mexico (Hall, 1981; Nelson, 1909). The elevational range of the records for the Omilteme rabbit is 2,133–3,048 m (Nelson, 1909). No fossil evidence is available for the species (Diersing, 1981).

ECOLOGY. The Omilteme rabbit dwells in dense cloud

forests (Chapman and Ceballos, 1990), where it shares its habitat with 37 species of mammals (Jiménez Almaraz et al., 1993). In addition to *S. insonus*, other mammal species restricted primarily to cloud forest habitat include *Hylonycteris underwoodi* (Underwood's long-tongued bat), *Artibeus aztecus* (highland fruit-eating bat), *Myotis volans* (long-legged myotis), *Liomys pictus* (painted spiny pocket mouse), *Bassariscus sumichrasti* (cacomistle), and *Potos flavus* (kinkajou—Jiménez Almaraz et al., 1993). Although *S. insonus* is not considered sympatric with the Mexican cottontail (*S. cunicularius*) because *S. insonus* does not occur in the preferred habitat of *S. cunicularius* (pine, oak, and pine-oak), the Omilteme rabbit has elsewhere been reported in pine forests of *Pinus*, *Quercus*, and *Alnus* (Chapman and Ceballos, 1990). *S. insonus* lives in dense undergrowth, makes runways, and occupies burrows under rocks or similar shelter. The Omilteme rabbit is difficult to catch because it is mainly nocturnal (Nelson, 1904, 1909).

CONSERVATION STATUS. The small village of Omilteme, from which *S. insonus* was originally described, lies in the center of Omiltemi State Ecological Park (Parque Ecológico Estatal de Omiltemi) and was declared a natural reserve area of ca. 3,613 ha by the State Government (Luna Vega and Llorente Bousquets, 1993). Nevertheless, major threats to the survival of the Omilteme rabbit are poaching and deforestation. Forests of the region have been intensively logged, resulting in significant fragmentation of habitat (Chapman and Ceballos, 1990). The Omilteme rabbit is a rare species and its distributional range is <500 km² (Ceballos and Navarro, 1991). Recently, Mexican biologists conducted an inventory of the mammals of the park, and they could not confirm the presence of *S. insonus* (Jiménez Almaraz et al., 1993). Therefore, the Mexican government declared the species endangered (SEDESOL, 1994).

Intensive surveys are needed to ascertain whether or not the Omilteme rabbit is extant and, if so, to determine its present distribution (Chapman et al., 1990). Among the activities of high priority to conserve *S. insonus* are status surveys, habitat conservation and management, regulation of hunting, research, and captive breeding (Chapman et al., 1990).

REMARKS. *Sylvilagus* is derived from the Latin *sylva* and *lagos* meaning hare of the woods (Alvarez-Castañeda and Alvarez-Solorzano, 1996). No information is available on the specific epithet *insonus*. The holotype (United States National Museum 126878—Wilson, 1991) was considered an adult by Nelson (1909). However, Diersing (1981) concluded that it is a juvenile since the supraoccipital-exoccipital sutures are open. In addition, Nelson (1904, 1909) described the underside of the tail of *S. insonus* as dingy brownish buffy whereas Diersing (1981) reported a bicolored tailed that is whitish ventrally.

The phylogenetic relationships of *S. insonus* to other species of *Sylvilagus* are unclear. *S. insonus* and *S. brasiliensis* were considered to be more closely related to each other than to other species of the genus and were placed in the subgenus *Tapeti*, along with *S. aquaticus* and *S. palustris* (Nelson, 1909). Later, *S. insonus* was transferred to the subgenus *Sylvilagus* (Hershkovitz, 1950), because it does not appear to be a *Tapeti*—although it shows a superficial resemblance to *S. aquaticus*. Finally, morphological comparisons between *S. brasiliensis*, *S. dicei*, and *S. insonus* using univariate and multivariate techniques indicate that *S. brasiliensis* and *S. dicei* are more closely related to each other than either is to *S. insonus*, and they support the placement of the latter species in the subgenus *Sylvilagus* (Diersing, 1981).

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